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## The potential of MOOCs to widen access to, and success in, higher education study

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# **The potential of MOOCs to widen access to, and success in, higher education study**

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## **Abstract**

Massive Online Open Courses (MOOCs) have become a much discussed development within higher education. Various claims and counter claims about the role and significance of MOOCs are being made, including their perceived role to widen access to higher education in both developed and developing countries. Much of this debate focuses on the philosophical and operational similarities and differences between the types of MOOCs that have emerged to date. In contrast there has been much less discussion about how such courses do, or do not, fit in with existing expectations of, and reporting on, higher education in term of increasing participation rates in higher education, of widening participation to members of society that have not traditionally participated in higher education, and of successful completion of higher education qualifications. Similarly, there has been little comparison of the role of MOOCs with the past experiences of larger online open and distance learning courses operated by 'open' universities around the world. This paper compares and contrasts the ways in which current MOOCs and one particular large population online Open University course from a decade earlier have served or might serve those objectives. The paper concludes that MOOCs, like open educational resources (OER), are forcing a re-conceptualisation of higher education study amongst all universities that was previously mainly found in 'open' universities and that they should also frame a re-conceptualisation of the measures widely used as part of national and international policy.

**Keywords:** Open educational resources; MOOCs, widening participation, policy and practice

## **Introduction**

Massive Online Open Courses (MOOCs) have become a much discussed development within higher education under the aegis of open education (Daniel, 2012). Although the first MOOC appeared in 2009 it was not until 2011 and 2012 that they burst upon a wider public consciousness (Universities UK, 2013) and attracted significant policy attention. In one sense MOOCs are a technology-enabled development of the slightly longer-lived open educational resources movement that has provided access to many of the supporting materials used in higher education teaching programmes only previously available to registered students (Lane, 2008), in another they represent an opening up of a burgeoning online education effort being used with traditional students within higher education institutions in an effort to enhance the teaching and learning experience (Johnson et al, 2012; Yuan and Powell, 2013).

Various claims and counter claims about the role and significance of MOOCs are being made in online media (e.g. Boxall, 2012; Craig, 2012), including their degree of openness and their perceived role to widen access to higher education in both developed and developing countries (Liyanagunawardena et al, 2013). Much of this debate focuses on the philosophical and operational similarities and differences between the types of MOOCs that have emerged to date (Universities UK, 2013; Rodriguez, 2013) although nearly all are free to participants with no up front fee, and all are open entry, in that no prior qualifications are required of the enrolees (although many do stress the expected level of prior attainment). In contrast there has been much less discussion about how such courses do, or do not, fit in

with existing expectations of, and reporting on, higher education in term of increasing participation rates in higher education, of widening participation to members of society that have not traditionally participated in higher education, and of successful completion of higher education qualifications (e.g. OECD, 2013; EU, 2012). Similarly, there has been little comparison of the role of MOOCs in supporting these broader societal and governmental aims with the past experiences of doing so through open and distance learning courses operated by 'open' universities around the world. This paper reviews what is currently seen as commonly agreed socio-economic policy objectives for participation in higher education around the world and compares and contrasts the ways in which MOOCs and their large population open university counterpart courses serve or might serve those policy objectives. It does so by building upon conceptual frameworks that I have previously been applied to the role of open educational resources in widening participation to higher education study (Lane, 2012).

### **Policy objectives in widening participation in higher education**

Widening participation in higher education has different dimensions. OECD regularly publish data on the proportion and type of people completing specified levels of education but not the numbers that participate for some period but do not 'complete' a particular level (e.g. OECD, 2013). The report is clear about the benefits of educational attainment:

*Educational attainment is frequently used as a measure of human capital and the level of an individual's skills, in other words, a measure of the skills available in the population and the labour force. The level of educational attainment is the percentage of a population that has reached a certain level of education. Higher levels of educational attainment are strongly associated with higher employment rates and are perceived as a gateway to better labour opportunities and earnings premiums. Individuals have strong incentives to pursue more education, and governments have incentives to build on the skills of the population through education, particularly as national economies continue to shift from mass production to knowledge economies. (OECD, 2013, p28)*

While it follows that widening access to, and attainment in, higher education has both a social and an economic dimension, as noted in this quote, the levels of educational attainment in a particular population may hide great inequalities in the chances and opportunities to do so throughout all sectors in society. Indeed, widening participation, rather than widening access, is a relatively new term used within higher education. For instance, within the European Higher Education Area (EHEA)<sup>1</sup> and following the Bologna Declaration in June 1999 it was not until 2009 (EU, 2009) that they focussed on equitable access and completion:

*The student body within higher education should reflect the diversity of Europe's populations. We therefore emphasize the social characteristics of higher education and aim to provide equal opportunities to quality education. Access into higher education should be widened by fostering the potential of students from underrepresented groups and by providing adequate conditions for the completion of their studies. This involves improving the learning environment, removing all barriers to study, and creating the appropriate economic conditions for students to be able to benefit from the study opportunities at all levels. (EU, 2009 p2)*

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<sup>1</sup> Currently involving 46 countries within Europe

They go on to note that widening participation shall also be achieved through lifelong learning and that intermediate qualifications within the first cycle at the national level can be a means of widening access to higher education.

Widening participation as a concept has been most debated and developed within UK policy and practice circles for over 10 years and what it encompasses has varied. Accordingly, there is no settled definition of widening participation but the Higher Education Funding Council for England recently stated on their website:

*We see widening participation as a broad expression that covers many aspects of participation in HE, including fair access and social mobility. We continue to emphasise - but with renewed focus – that addressing widening participation relates to the whole 'life-cycle' of a student in HE. This covers pre-entry, through admission, study support and successful completion at undergraduate level, to progress on to further study or employment. (Hefce, 2013).*

This definition identifies that certain societal groups or communities may be excluded from current educational provision (the type of student) and that a number of factors may be involved (that involve the processes used to administer HE) and assumes equality of outcomes. While it may be simple to use socio-economic class as a major measure of potential exclusion it is another matter to disentangle the wide variety of reasons that effectively lead to this exclusion.

Inevitably, as outlined by Lane (2012) the chance to participate is constrained firstly by the absolute *availability* of places for study within a country (e.g. the number of higher educational institutions and the capacity of those institutions to teach students). It is constrained secondly by the *affordability* of opportunities (for instance study may involve great costs) and thirdly by its *accessibility* (such as being taught in a second or third language for the student or involving significant travel). Fourthly there is a question of *acceptability* of the opportunities on offer (for example the provision may be of poor quality, have an implied bias in the intellectual position taken by the teachers or it may be in subjects prospective students do not want to study). Nevertheless, even where provision is available, affordable, accessible and acceptable it may not be taken up by some less privileged groups in society for other, wider, physical, social, psychological and cultural reasons.

## **The emerging shape of MOOCs**

### *Background*

MOOCs have not been initially been driven by explicit policy initiatives either at a national or institutional level. They have arisen through the social entrepreneurship of key individuals and/or institutions, each of whom probably has different short-term and long-term motivations for running MOOCs. There has been extensive discussion and debate about them in the regular and social media spheres (e.g. Boxall, 2012; Craig, 2012), which indicate, in part, a desire to improve educational opportunities for learners on the basis that current opportunities are insufficient or ineffective. In contrast the academic literature on MOOCs has been sparse as they are generally so new that little time has elapsed for detailed studies to be undertaken, although that is quickly changing as special edition of journals<sup>2</sup> become

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<sup>2</sup> For example see <http://jolt.merlot.org/> or <http://www.educause.edu/library/resources/research-practice-assessment-rpa-special-issue-moocs-and-technology>

devoted to MOOCs as do many conferences. Most articles to date have concerned cMOOCs which began earlier than the xMOOCs (Rodriguez, 2013) now gaining so much attention (the former are characterised pedagogically by less structure, facilitation rather than teaching and greater learner autonomy; the latter as online equivalents of classroom based teaching models). This newness, coupled with logistical difficulties in getting either pre-enrolment or exit data on the participants, means that it is difficult to compare MOOCs from different providers, let alone make comparisons with fee-based large online courses. However two notable sources give some early indications of who is attracted to these MOOCs and how do those 'students' perform.

#### *MOOC and enrolled student characteristics*

The first source of data on MOOCs and their student characteristics comes from a researcher who has been trying to aggregate any published information on MOOCs and in particular the stated completion rates where there are different assessment modes (Figure 1) and where the course length varies (Figure 2). This meta-analysis shows that reported completion rates are very low whatever the characteristics of the MOOC. Further, the general pattern across many of these MOOCs is that there is up to a 50% drop out in the first two weeks which drops down to 25% still participating through later weeks but with less than half that proportion actually completing the assignments. This pattern has caused much debate around what it means to participate in a 'free' course and whether completion is as meaningful as it is for a credit-bearing course that is part of a qualification. An argument put forward is that as these courses are free, they should be seen as more akin to academic books, public lectures or educational broadcasts where many may start to engage but few stay the course and those that do not still gain what they want from the experience. In other words the learner decides what is success for them, not the course provider or a policy maker.

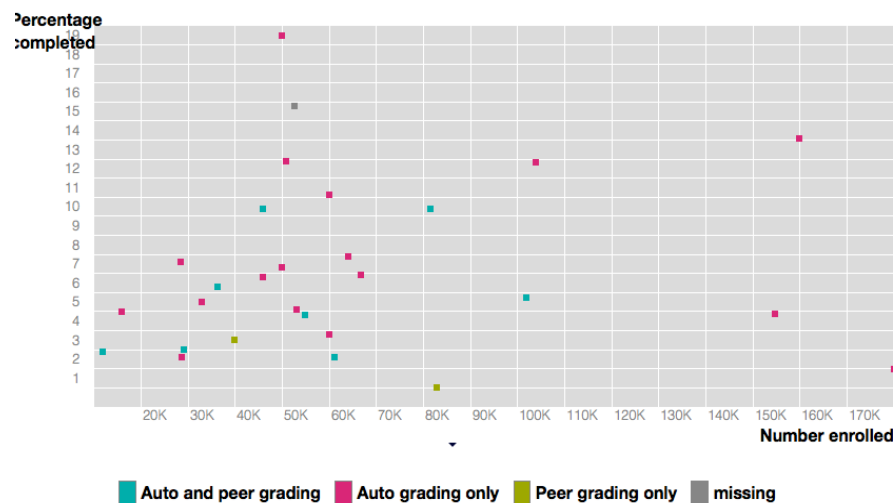


Figure 1 Graph of completion rates versus enrolment numbers for many MOOCs with different assessment modes (Source: Katy Jordan<sup>3</sup>)

<sup>3</sup> See <http://moocmoocher.wordpress.com/2013/02/13/synthesising-mooc-completion-rates/>

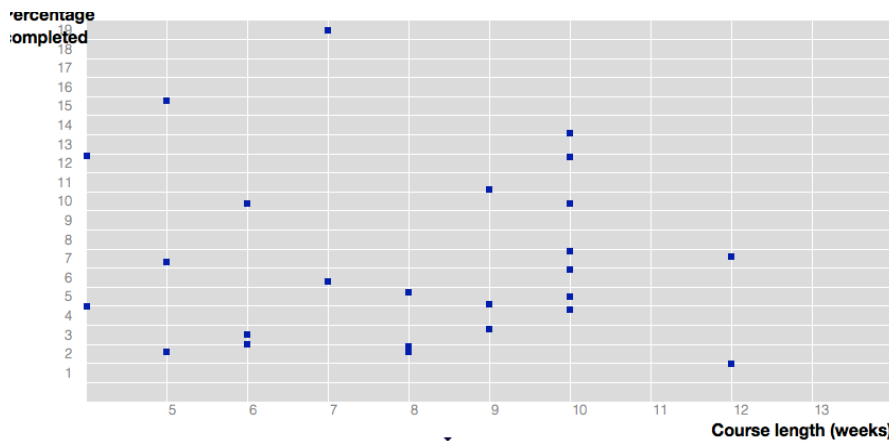


Figure 2 Graph of completion rates versus course length for many MOOCs (Source: Katy Jordan)

The second source is a report from the University of Edinburgh (Edinburgh @ MOOCS Group, 2013) who have run six MOOCs through Coursera and surveyed 'students' on entry and, where possible, on exit from those courses. Figure 3 shows the age distribution, which is very widespread, while Figure 4 details their highest previous level of academic study, which indicates that over 70% were well educated (five of the courses were at undergraduate entry level, one was at postgraduate level). Of these, 75% indicated this was their first experience of a MOOC and 53% were enrolled on only one MOOC. The majority were female (54%) but this varied widely across the six courses from different disciplines e.g. the E-Learning and Digital Cultures course had 59% women. The 'students' came from many countries with 28.0% from the US, 11.0% from the UK, 4.6% from India down to 1.8% for Germany which was the 10<sup>th</sup> in the list by proportion. So overall the student body came from all around the globe, as has also been reported for most other MOOCs.

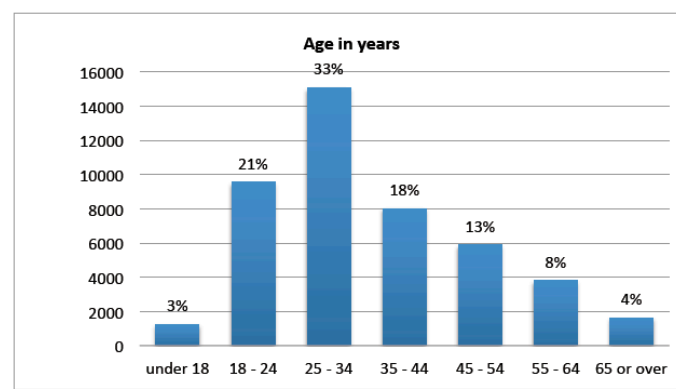


Figure 3 Age distribution on entry to first wave of Edinburgh MOOCs on Coursera (Source: Edinburgh @ MOOCS Group, 2013)

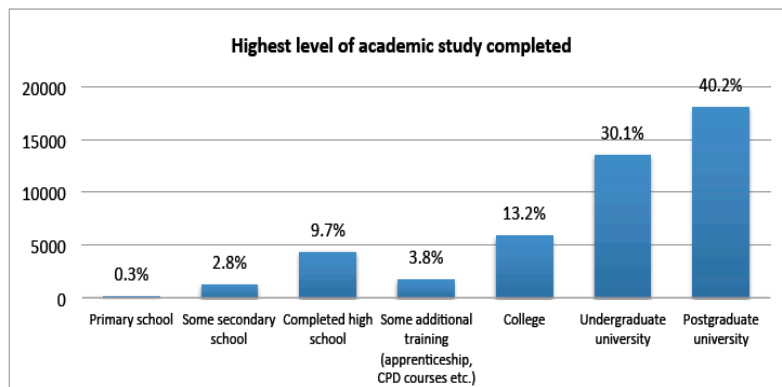


Figure 4 Level of academic achievement on entry to first wave of Edinburgh MOOCs on Coursera (Source: Edinburgh @ MOOCS Group, 2013)

The aspirations or motivations for enrolling and completing a MOOC vary with a greater number of reasons being shown on exit (Figure 6) compared to enrolment (figure 5), although interestingly it is the interest led rather than career/achievement led reason that dominate both (the subject matter of the MOOCs will influence this in part but the high previous educational qualifications will do in part as well). Whatever the reasons 77% of completers surveyed found the courses met or exceeded their expectations.

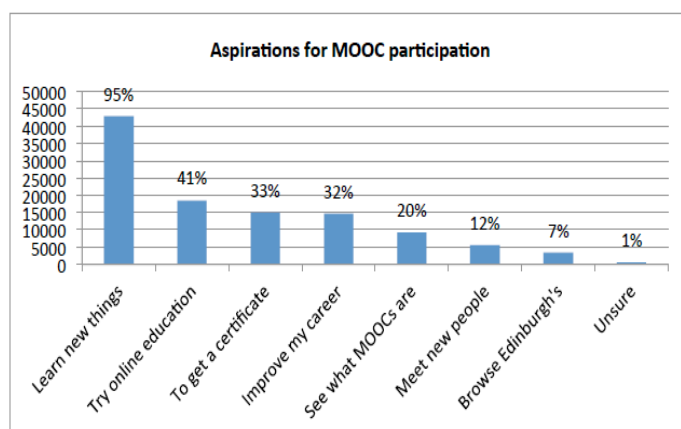


Figure 5 Aspirations on entry for the first wave of Edinburgh MOOCs on Coursera (Source: Edinburgh @ MOOCS Group, 2013)

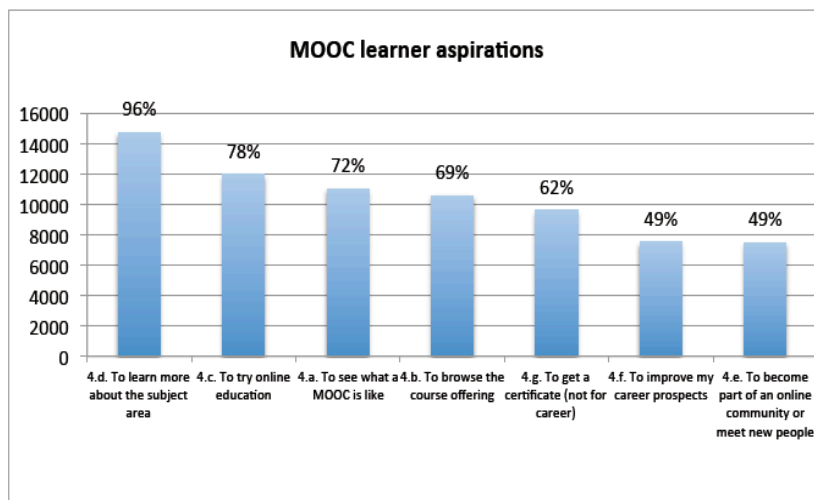


Figure 6 Aspirations on exit for the first wave of Edinburgh MOOCs on Coursera (Source: Edinburgh @ MOOCs Group, 2013)

## The historical emergence of a large population online course at The Open University

### Background

The OU has a long history of using different media technologies to deliver its teaching and support students' learning<sup>4</sup> including the use of online/web-based technologies, beginning in the late 1980s and culminating in the first large scale credit-bearing 'online' course in 1999<sup>5</sup>. This latter course, *T171 You, your computer and net* is the focus of this section. I first set out its characteristics and student demographics and behaviour before going on in the next section to contrast it with the information on MOOCs from the previous section.

Many of the details of this course have been analysed before (Weller, 2000; Mason and Weller, 2000; Weller and Robinson, 2001) but I want to take a personal, historical perspective of it. While I was not directly involved in the course myself, I did take a particular interest in it as I took up the post of Dean of the course's host Faculty (the Technology Faculty at that time) on January 1 2000 and had to deal with its effects on both the Faculty and University.

To provide the context, the Technology Faculty prior to 2000 had had a single 60 CATS credits level 1 (first year course) called *T102 Living with Technology* that spanned six major technological/engineering topics including information technology and communications. With around 3-4,000 students per annum, it still delivered most of the teaching materials in printed texts and had face to face tutorials but it also included many computer based activities delivered on CD-ROM/DVD and used computer mediated communications for student to student and student to tutor discussions. T102 was coming to the end of its planned life and for various reasons the Faculty decided in the late 1990s that it did not want to develop a direct replacement course as it had done twice before in its history, but develop a set of more focussed 30 CATS credits courses. Three members of academic staff

<sup>4</sup> See <http://www.open.ac.uk/researchprojects/historyofou/learning-teaching-and-research>

<sup>5</sup> See <http://www.open.ac.uk/researchprojects/historyofou/story/1990s-decade-technological-expansion>



took this opportunity to propose that one of these courses needed to reflect the major technological development of our time – the Internet – both in terms of discipline content and mode of teaching and learning. John Naughton<sup>6</sup>, author of the later books *A Brief History of the Future: The Origins of the Internet* and *From Gutenberg to Zuckerberg: What you really need to know about the internet* was the first; Martin Weller<sup>7</sup>, later author of *Delivering Learning on the Net: the why, what and how of online education* and *The Digital Scholar: How Technology Is Transforming Scholarly Practice* was the second; and Gary Alexander<sup>8</sup>, later author of *eGaia Growing a peaceful, sustainable Earth through Communications* was the third.

### *Course characteristics*

This open entry 32 week course (as with all OU undergraduate courses at the time) was designed as three independent but linked 10 CATS credits blocks dealing respectively with becoming a confident computer user, the story of the personal computer and the story of the internet, and so was an entry-level course about information and communication technology delivered entirely over the web with online tuition<sup>9</sup> (Mason and Weller, 2000). The course team were also trying to take advantage of the internet as a delivery mechanism in terms of (1) quick production; (2) quick alteration and updating of course material; (3) interaction with, and feedback, from students; (4) interactive materials and (5) flexibility in study patterns (Weller, 2000). Owing to its innovative nature the course was piloted, starting in February 1999, with nearly 900 students (although the initial target was 500); but demand for the course was high and subsequently nearly 12,000 students enrolled on two presentations in 2000 (originally the plans were to have one February presentation capped at 8,500 students but demand forced us to put on a second May presentation for a further 3,500 students). This large demand caused many issues for operating on such a large scale online, as described by Weller and Robinson (2001), that feel very similar to some of the many issue faced by the pioneers of MOOCs in recent years. As we shall see in the next section dealing with student characteristics and behaviours, it was recognised very early on that many students were most interested in the first block as at the time the general interest in using computers and surfing the internet was expanding greatly, and many did not complete the course. It was therefore decided to 'spin-off' the first module into a 10 CATS credit course (known as *TU170 Learning online*<sup>10</sup>) first presented from May 2001 and a new block added to T171 dealing with e-business for February 2002 (2001 was the only other year with a May presentation). The course itself was replaced in 2005.

### *Student characteristics*

I can only give some headline figures here but in terms of numbers of students starting and finishing T171 two trends stand out. First, the explosive level of interest in its early years and the rapid drop off in numbers (some of this could be accounted for by the spin off course TU170 but this is only about 1500 students per annum – the rest was drop off in interest). The second was the much lower completion rate than the Faculty average showing much less desire to complete or to progress on to another module. In part this may reflect the

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<sup>6</sup> Now Emeritus Professor of the Public Understanding of Technology at the OU

<sup>7</sup> Currently Professor of Educational Technology at the OU

<sup>8</sup> Now retired

<sup>9</sup> Although there was one optional face to face tutorial provided at the outset of the course and there were two set books provided with wrap around academic material on the course web site.

<sup>10</sup> And which co-incidentally fitted in with a new programme of 10 CATS credit courses called Relevant Knowledge all of which were run as online courses and covered a variety of topics of variable popularity

nature of the students as indicated in Table 2 and discussed below including a fair proportion with no direct financial commitment.

Table 1 Initial course populations and completions by year

Year	1999	2000	2001	2002	2003	2004
No. students at course start	844	11,193	11,524	9,018	5,351	3,032
Percent sat exam – T171	36.6	45.0	42.4	42.4	46.6	47.2
Percent sat exam – all Technology Faculty undergraduate courses	62.1	54.6	53.2	54.4	58.0	62.6

When we look at some of the demographics of the students taking T171 in its first two years as shown in Table 2 it can be seen that the T171 pilot in 1999 was different from the larger scale presentations in 2000 and both were different to another entry level course in the Faculty. Interestingly T171 attracted a greater proportion of current OU students with a higher proportion of female students. It should also be noted that in 2000 13% of all T171 students were in receipt of financial assistance whereby their course fee was paid for them.

Table 2 Major characteristics of T171 students compared to a 60 CATS credit level 1 course

Percentage registered	T171 in 1999	T102 in 1999	T171 in 2000
<i>All students</i>			
New	70	86	73
Continuing	30	14	27
<i>Age range</i>			
< 25	5	11	8
25-29	10	22	16
30-39	31	44	40
40-49	25	17	23
50-59	17	4	9
60-64	5	1	2
>65	5	1	2
<i>Gender</i>			
Male	55	79	65
Female	45	21	35
<i>Ethnic origin</i>			
Asian	2	1	2
Black	1	3	2
White	72	74	72
<i>Disability</i>			
Disability	6	3	4
<i>Previous qualifications</i>			
Low	7	7	10
Lowish	29	40	37
Medium	16	25	19
High	37	19	26

If we now look at what students completing T171 thought about the course it is surprising that so many students rate it more highly than the Faculty average for most factors although the amount of time needed to study it was much perceived as much greater. Of course it would be interesting to have the view of those that did not complete but it has always proved difficult to get responses from both passive withdrawals (ones who don't let us

know) and even active withdrawals (ones that do) with the latter most often citing 'life events' as getting in the way of their studies and not the content or nature of delivery of the course.

Table 3 Percentage of *completing* T171 students agreeing with statement

T171 completers	2000		1999*	
	T171	Technology overall	T171	Technology overall
The course met its aims and objectives <i>very</i> successfully	29.4	27.1	32.1	21.3
I was <i>very</i> satisfied with overall course quality	35.7	27.9	44.4	33.5
I was <i>very</i> satisfied with the quality of tuition.	22.3	35.5	30.1	32.2
I found the course <i>very</i> interesting	48.4	38.2	54.1	41.4
The time spent study was <i>a lot more than expected</i> .	50.8	34.0	59.0	31.8
I found the academic level <i>very</i> difficult	4.0	8.1	8.1	14.5
I would recommend the course to another student	87.9	76.3	90.4	82.9

## Discussion

It is tricky to draw very firm parallels between current day MOOCs and their fore runner massive online courses within open universities. While both are open entry the fee for a credit bearing course tied to grant support and the nature of tuition and support meant the OU course was much more geographically focussed (most students were from the UK); most students were already distance learners (probably not the case with MOOCs); and most were signing up for a long duration course lasting 32 weeks (in contrast most MOOCs last ten weeks or less). Nevertheless, there are a number of similarities and differences which it is worth commenting on, particularly in relation to access and achievement in higher education study.

First, for T171, like many early xMOOCs, the medium was the message. The extensive interest that surprised the early course providers in both cases was in subjects that related very much to computers and communications technologies. In both cases too online courses have quickly moved into many other disciplines.

Second, interest in the topic seemed to be a prime motivating factor rather than any vocational or job related factors. However, whereas that interest in MOOCs has been mostly with the already well educated, the interest in the OU course was from as diverse a background as most other OU courses. The fact that the course was clearly part of the

existing credit bearing provision rather than a separate adjunct to it might account for some of this difference.

Third, completion rates were much higher for the OU course than nearly all MOOCs to date. Again, the fact that T171 was part of existing credit bearing provision would account for this as well as the higher levels of direct tutorial support provided by Associate Lecturers compared to the much lower levels of personal support given in MOOCs. In fact there are many different logistical challenges provided by large numbers of students as noted by Weller and Robinson (2001) and Mason and Weller (2000).

## Conclusions

This paper concludes that MOOCs, like open educational resources (OER), are forcing a re-conceptualisation of higher education study amongst all universities that was previously mainly found in 'open' universities and that they should also frame a re-conceptualisation of the measures widely used as part of national and international policy.

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